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AUTHOR	Flournoy, Nancy
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ABSTRACT

Some of the schools participating in the Southwest Regional Laboratory's Instructional Management System (IMS) pilot test submitted input data forms to and received processed information from regional processing and data collection centers. To determine the feasibility of alternative methods of data collection and output return, evaluative data were collected at the time each set of data were delivered to the centers. Described in this document are the procedures for the completion of the evaluation forms. Sample forms together with a flowchart of the IMS operation as a whole are included. (DGC)

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TECHNICAL NOTE

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AUTHOR: Nancy Flournoy

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ABSTRACT

Three sites through which IMS student materials pass have been identified as Processing and Data Collection Stations. These are (1) the Forms Control Station (FCS) where scannable data sheets are received from the schools and manually preprocessed under ComSys 1 and 2 Input Modes and where reports and other computer system output are postprocessed; (2) the Scanner Station where the Source Scan Tape is made; and (3) the 690 Station where the Source Scan Tape is further processed, and data transmission to and from the central computing facility is accomplished. This document describes each of the time variables for which data is to be collected as the IMS pupil material is processed in these three Stations.

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COLLECTION OF IMS TIME EVALUATION DATA

Introduction

Under ComSys 1 and 2 operation procedures there are three Processing Stations (the Forms Control Station, the Scanner Station, and the 690 Station). Therefore, in order to monitor the time efficiency of the whole system, individual operation times of each Station must be monitored as well. By analyzing total processing time in terms of short time intervals composing the whole, problems in the system can be pinpointed and dealt with at their source.

Doug Aims (TN 5-71-25) describes processing time in interval segments small enough to account for a single identifiable processing step. The measurability of each time interval was considered and their value in terms of their evaluative and predictive information was weighed against their availability in terms of the time and cost involved in their collection and recording. A reduced list of times to be measured was established based on these considerations by combining some processing steps.

Collection of Measurements

The time intervals and the time variables composing them are collected on two separate logs and cross-referenced by the Run Number (a sequential number assigned to a batch of pupil data processed in a unit). This batch of pupil scores composes an IMS Data Run, and is distinguished from a computer run since one Data Run may require more than one computer run if complications occur. A Maintenance Run is defined

as one in which an entire class roster is added to the Pupil Data Base Tape or individual pupil records on the Pupil Data Base Tape are altered.

The first log, IMS RUN CONTROL SHEET-I (Attachment 1), contains the identification for each class unit in the Data or Maintenance Run and all time measurements which vary by school class. The second log, IMS RUN CONTROL SHEET-II (Attachment 2), contains all time measurements to be collected which are constant over all school class units in the Data Run. All data for the former are recorded in the Forms Control Station during preprocessing, while some data for the latter are recorded in each of the three Stations. A flow chart of the data collection procedures was abstracted from TN 5-72-03, Figure 6: "Response Sheet Processing" and is found in Attachment 3.

Those variables to be keypunched for evaluation of IMS processing are so indicated by their accompanying column numbers. Tn and DTn refer to the nth time variable and the nth time interval recorded, respectively, during IMS processing.

IMS RUN CONTROL SHEET-I: Description of Data

As pupil data is received (via ComSys 1 or 2) in the Forms Control Station (FCS) the following information is recorded on IMS RUN CONTROL SHEET-I.

Columns

1 — IMS Run Type: The following codes are assigned to each run type: "1" for a Data Run, "2" for a Maintenance Run. For run type 2 only the first 21 columns of IMS RUN CONTROL SHEET-I are to be filled out and then only when pertinent.

Columns

2-4 IMS Run Number: A sequential numbering of a batch of data which will be processed as a unit. Scan forms, error data, and the various computer printouts are to be coded manually with this number for cross-referencing and for filing.

5-6 Card Number: A sequential numbering of the school classes assigned to a given Run.

7 ComSys Mode In: Code "1" for main mode input; "2" for courier mode input; "3" for scanner mode input; and "4" for teletype mode input.

8-19 Class ID: Class, District, School, Teacher, Program, and Grade are coded into six 2-digit numbers. These are read off each cover sheet with the aid of a coded template.

20-21 Unit Number: A 2-digit code ranging from 1 to 10 or 15 depending on the program of instruction.

22-27 Date of Test (T1): Month, day, and year of test are taken from the cover sheet for each class unit. If missing, date is estimated and so indicated in Column 36.

--- Date Data Leaves Site (T2): For mail mode input, T2 is the month and day of the postmark on the received envelope; for courier mode input, T2 is month and day of pickup; for other input modes, T2 is the same as data is received which is to be recorded in the 690 Station.

--- Time Data Leaves Site (T3): This field is blank for mail mode input; and logged by courier for courier mode input.

--- Date Data Arrives at FCS (T4): Month and day for mail and courier mode input. T4 equals T2 for other input modes.

--- Time Data Arrives at FCS (T5): Time of mail delivery or time courier returns, measured in hours and minutes. Field is blank for other input modes as data arrives at the 690 Station.

28-29 DT1 (T2-T1) is the time interval between "Time of Test" and "Time Data Leaves Site," measuring delay time between testing and onset of transmission to FCS in days.

30-31 DT2 (T4-T2) is the time interval between "Time Data Leaves Site" and "Time Data Arrives at FCS," measuring transmission time from the school or district site where data is mailed to FCS in days for mail mode only.

Columns

32-34 DT3 (T5-T3) is the time interval between "Time Data Leaves Site" and "Time Data Arrives at FCS," measuring transmission time from the school or district site to FCS in minutes for input modes other than mail.

36 Record "1" if date missing on ID sheet.

38 Record "1" if some or all data must be reprocessed.

Also, in the Forms Control Station, the Run Number is to be recorded on IMS RUN CONTROL SHEET-II in columns 2-4 which then accompanies the scan sheets to the Scanner Station for further processing.

IMS RUN CONTROL SHEET-II: Description of Data

The following information will be entered on IMS RUN CONTROL SHEET-II as the data passes through each processing Station.

Columns

1 IMS Run Type: Assign the following codes to each run type: "1" for a Data Run, "2" for a Maintenance Run.

2-4 IMS Run Number: Number assigned at the Forms Control Station, matching that in columns 2-4 on IMS RUN CONTROL SHEET-I.

Scanner Station

Columns

--- Operator Name: Signature or initials identfying scanner operator for this Run.

5-6

7 Number of Scan Reruns: Numbers of times the data set comprising a Run must be rescanned due to teacher or system errors or problems.

Columns

--- Mo/Da: Date of scanner operation for this Run recorded as 2-digit numbers. If scanning must be repeated, additional dates are noted.

--- Source Scan Tape Number: Same number as labeling the Source Scan Tape which is created from the raw pupil data on scannable sheets.

--- Scanner Time On (T6): Initial operation time measured in hours and minutes for first and second scanning. If data must be scanned more than twice, times for additional scannings are to be attached.

--- Scanner Time Off (T7): Final operation time measured when all forms for this Run have been run in hours and minutes. Times for additional runs are to be noted as for T6.

--- Scanner Operating Time: T6 subtracted from T7 measures elapsed scanner operation time in hours and minutes. This time will be converted to minutes and recorded as DT5 in the Forms Control Station. If more than two scannings have been made, the average operation of time is to be recorded and this average will be DT5.

Comment on any happenings which may have affected the times above (e.g., machine failure) are to be noted.

690 Station

Columns

--- Scan Tape Processor: Signature or initials identifying 690 operator using OPSN* to convert data from the Source Scan Tape to the Scores Data Input Tape.

8 Number of Processing Reruns: Number of times after the first that a Source Scan Tape must be processed by OPSN.

--- Mo/Da: Date of OPSN data conversion. If more than one OPSN run is performed, their dates are also recorded.

--- Scores Data Input Tape Number: Same as labeling the Scores Data Input Tape. The data on this tape was converted from the Source Scan Tape and is ready for Remote Job Service (RJS) to the central computing facility for IMS processing.

--- RJS Operator: Signature or initials identifying RJS operator.

*The program OPSN is currently being documented.

Columns

9-10 Number of Transmission Failures: Count of unsuccessful transmission attempts for the Run. If greater than 99, 99 is recorded.

--- Mo/Da: Date of RJS run is recorded in two 2-digit numbers. If RJS is run more than once, corresponding dates are recorded.

--- Time Line Up (T8): Onset of transmission from the 690 to the central computing facility, recorded only for the successful transmission occurrence in hours and minutes.

--- Report Output Tape EOF Time (T9): Time of the completion of report output print to tape, recorded in hours and minutes.

--- Report Output Tape Number: Same as labeling the Report Output Tape which is created by processing the Scores Data Input Tape.

Comments on any happenings which may have affected the times above are to be noted.

Forms Control Station

Columns

--- Post-Processor: Signature or initials identifying who post-processes system messages and teacher reports.

--- Mo/Da: Date system messages and teacher reports are received at the Forms Control Station for postprocessing, recorded as two 2-digit numbers.

--- Time Postprocessing begins (T10): Time measured in hours and minutes.

--- Input Queue Time (T11): Time following "IN AT" on the top line of front sheet of computer output as three 2-digit numbers, measured in hours, minutes, and seconds. If Run is to be reprocessed, additional times are noted.

--- Exec. Time (T12): Time computer execution begins is taken from the last line of letters and digits before "SWRL" on front sheet of computer output as three 2-digit numbers measured in hours, minutes, and seconds.

Columns

---	Output Queue Time (T13): Time on the same line as Input Queue Time except following "OUT TO...AT" on output, measured in hours, minutes, and seconds.
11-15	DT4 (T6-T4 & T5): Time interval between the latest time recorded under "Time Data Arrives at FCS" in IMS RUN CONTROL SHEET-I and "Time Scanner On," measuring preprocessing and the time scanner operation begins in minutes.
16-18	DT5 (T7-T6): Time interval between "Time Scanner On" and "Time Scanner Off" measuring scanner operation time in minutes.
19-23	DT6 (T8-T7): Time interval between "Scanner Time Off" and onset of data transmission from the 690 to the central computing facility, "Time Line Up" measuring time OPSN takes to process the Source Scan Tape plus any delay time between the Scanner Station and 690 transmission in minutes.
24-25	DT7 (T11-T9): Time interval between "Time Line Up" and "Input Queue Time," measuring the transmission from the 690 to the central computing facility in minutes.
26-31	DT8 (T12-T11): Time interval between "Input Queue Time" and "Exec. Time," measured in seconds.
32-35	DT9 (CPU Time): Seconds recorded from same line of computer output as "Exec. Time" found preceding "SEC," on the front page of the computer output.
36-40	DT10 (T13-T12): Time interval between "Exec. Time" and "Output Queue Time," measuring the total execution time including DT9 and any delays caused internally by computer processing control in seconds.
41-42	DT11 (T9-T13): Time interval between "Output Queue Time," and "Time Print Complete," measuring return transmission time from CCN to the 690 including any delay time in output queue in minutes.
43-37	DT12 (T10-T9): Time interval between "Time Print Complete" and "Time Postprocessing Begins," measuring the delay time between end-of-return transmission from CCN and beginning of postprocessing in the Forms Control Station in minutes.
---	Mo/Da: Date reports mailed, postprocessing complete, measured as two 2-digit numbers.

Columns

--- Time Postprocessing Complete (T14): Time reports prepared for deposit in mail bin, measured in hours and minutes.

--- DT13 (T14-T10): The time interval between "Time Postprocessing Begins" and "Time Postprocessing Complete" measured in minutes.

52-54 DT14 (T14-T4): Total processing time in days.

When time intervals measured extend over days, only the working hours in a day are considered. At present this is 8:00-12:00 a.m. and 1:00-5:00 p.m. For example, if end of transmission from the central computing facility to the 690 is 4:10 on 2/05 and postprocessing begins at 10:30 on 02/06, then the time interval T12 is 200 minutes: 50 minutes on one day plus 150 minutes the next. If the lunch break is taken, so comment and subtract one hour out of the affected time interval. Include all other delays and breaks as part of the operation time interval being measured.

RUN TYPE [1]

RUN NUMBER [2 3 4]

IMS RUN CONTROL SHEET - I

ATTACHMENT 1

CARD NO.	COMSYS	CLASS ID						UNIT NO.	TEST DATE T1			TIME DATA LEAVES SITE T2 / T3				TIME DATA ARRIVES FCS T4 / T5				DT1 = T2-T1	DT2 = T4-T2	DT3 = T5-T3		DATE EST.		STATUS	COMMENTS:
		DIST	SCHL	TEA	PROG	GRDE	CLSS		MO	DA	YR	MO	DA	HR	MIN	MO	DA	HR	MIN								
5 6	7	8 9	10 11	12 13	14 15	16 17	18 19	20 21	22 23	24 25	26 27									28 29	30 31	32 33 34		35 36		37	38

IMS RUN TYPE [ ] (1) IMS RUN NUMBER [ ] (2-4)

Attachment 2

IMS RUN CONTROL SHEET - II

Scanner Station

Operator Name _____ Number of Scan Reruns [ ] (7)

Date ____/____ (Mo. Day) Source Scan Tape No. _____

	1st Run	2nd Run	AVERAGE
Scanner Time On (T6)	____ : ____	____ : ____	
Off (T7)	____ : ____	____ : ____	
Operating Time (T7-T6)	____ : ____	____ : ____	____ : ____
	Hrs. Min.	Hrs. Min.	Hrs. Min.

Comments: _____

_____

_____

690 Station

Scan Tape Processor _____ Number of Processing Reruns [ ] (8)

Date ____/____ (Mo. Day) Scores Data Input Tape No. _____

Pupil Data Base Tape No. IMS DB _____

RJS Operator _____ Number of Transmission Failures [ ] (9-10)

Date ____/____ (Mo. Day)

Time Line Up (T8) ____ : ____ Report Output Tape No. _____

Report Output Tape EOF Time (T9) ____ : ____ (Hrs. Min.)

Comments: _____

_____

_____

Forms Control Station

Post-processor _____

Date ____/____ Postprocessing begins
Mo. Day

Time post-processing begins (T10) ____:____

	1st RUN	2nd RUN
Input Queue Time (T11)	____:____:____	____:____:____
Exec. Time (T12)	____:____:____	____:____:____
Output Queue Time (T13)	____:____:____	____:____:____
	Hrs. Min. Sec.	Hrs. Min. Sec.

Min. DT4 (T6-T4+T5) [| | | | |] 11-15

Min. DT5 (T7-T6) [| | |] 16-18

Min. DT6 (T8-T7) [| | | | |] 19-23

Min. DT7 (T11-T8) [| |] 24-25

Sec. DT8 (T12-T11) [| | | | | |] 26-31

Sec. DT9 (CPU Time) [| | | |] 32-35

Sec. DT10 (T13-T12) [| | | | |] 36-40

Min. DT11 (T9-T13) [| |] 41-42

Min. DT12 (T10-T9) [| | | | | |] 43-47

Date ____/____ Post-processing Complete
Mo. Day

Time Post-processing Complete (T14) ____:____
Hrs. Min.

Min. DT13 (T14-T10) [| | | | |] 48-51

Days DT14 (T14-T4) [| | |] 52-54

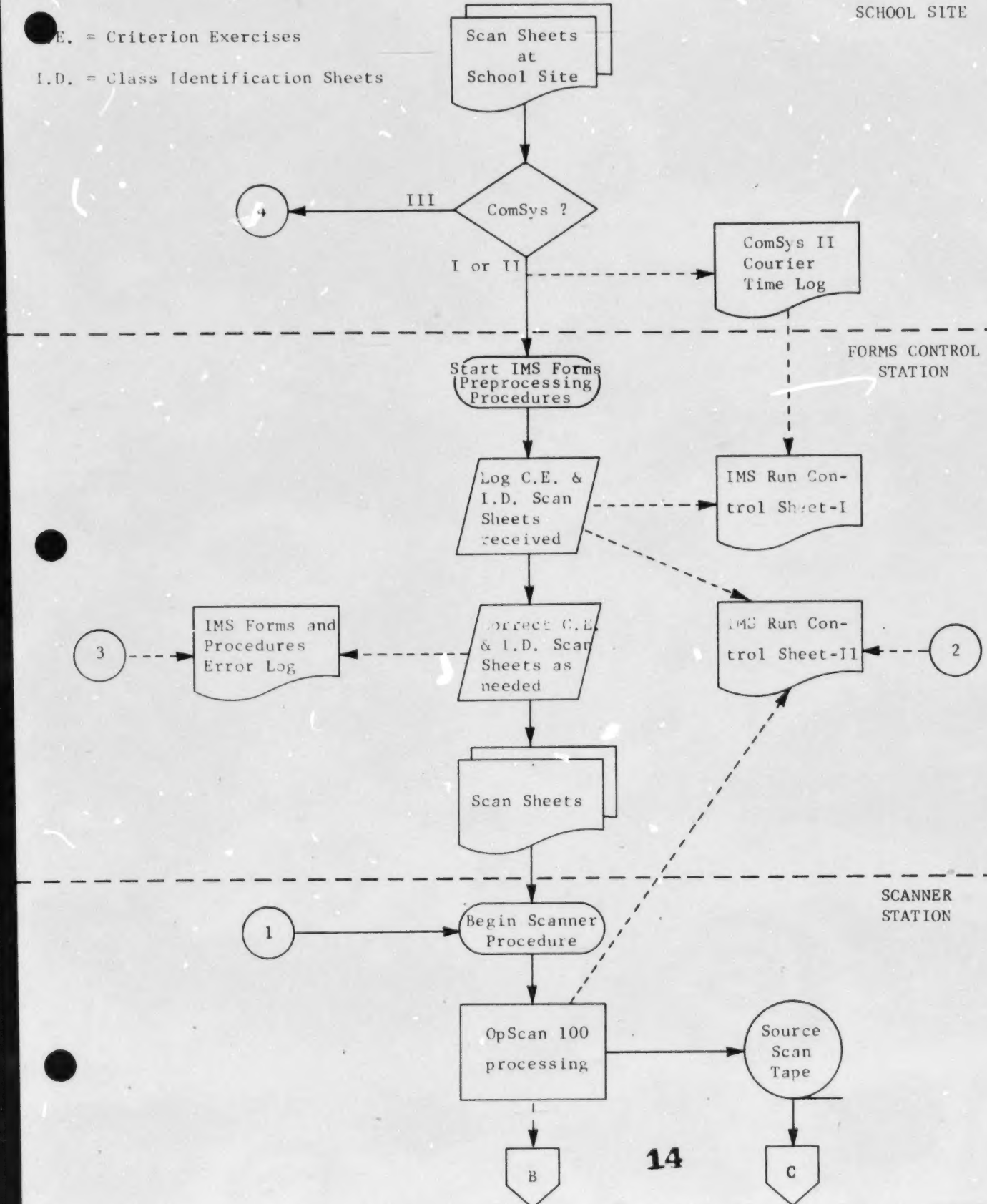
Comments: _____

_____

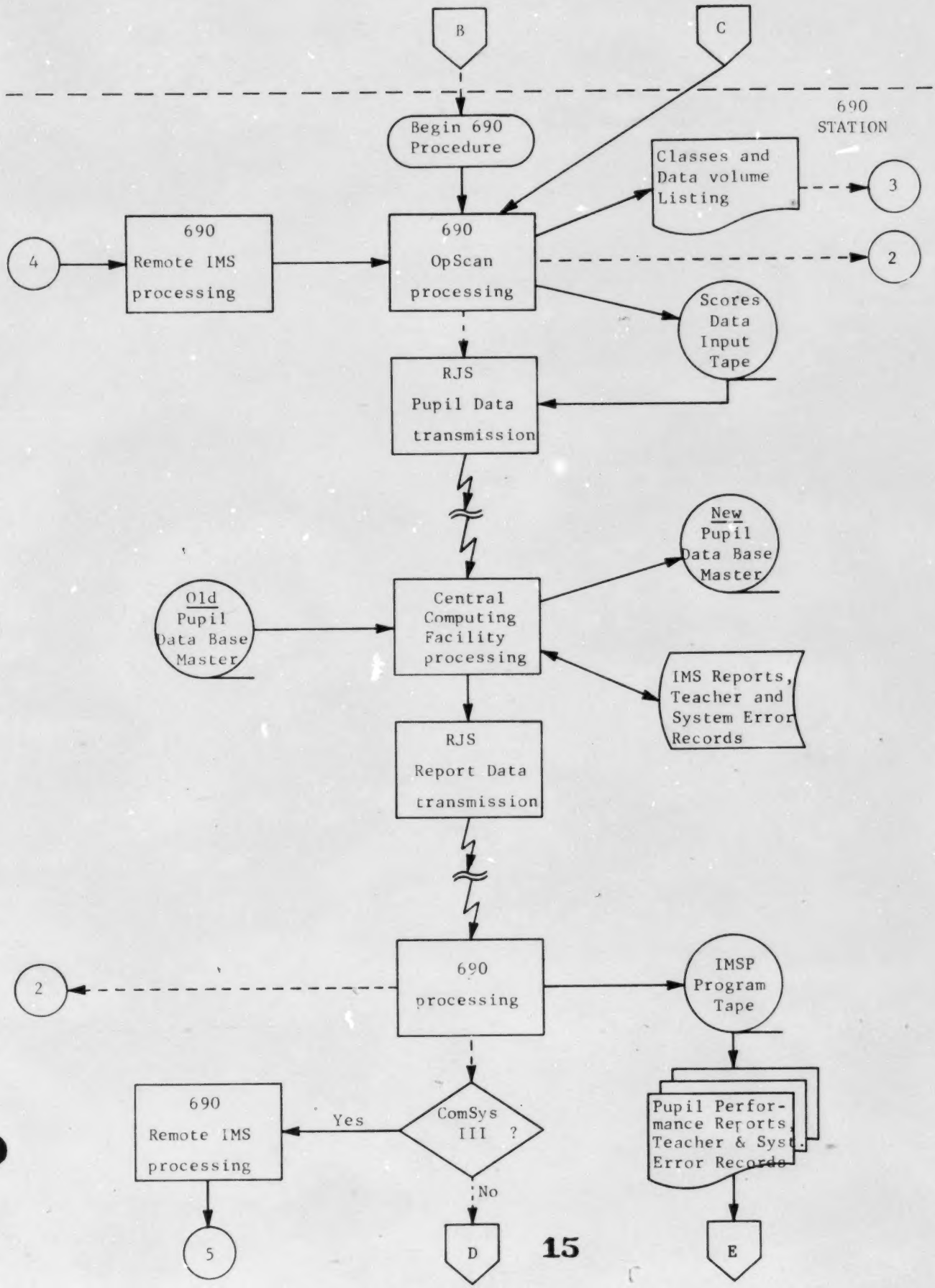
_____

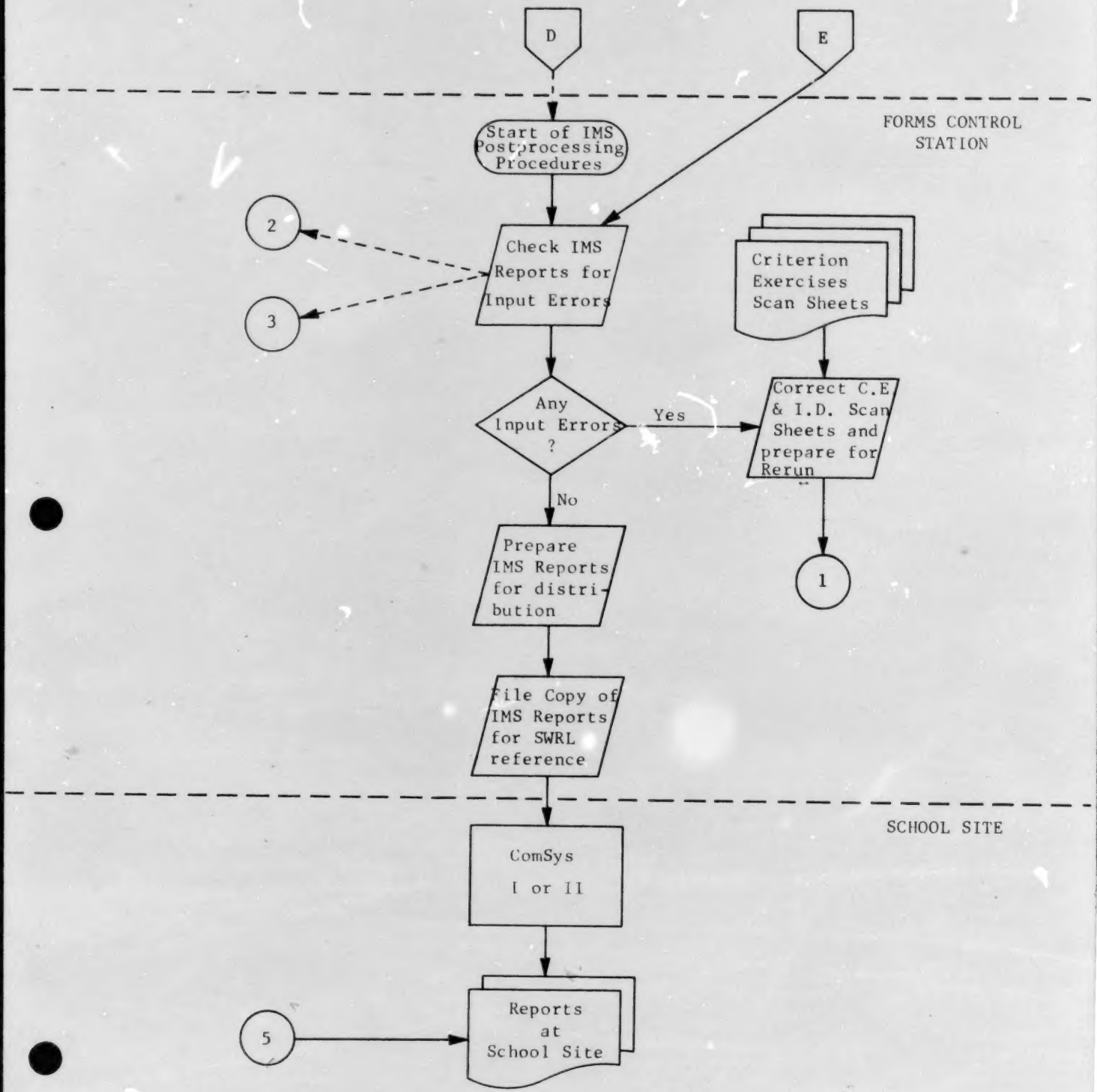
Attachment 3

IMS DATA COLLECTION WITH RESPONSE SHEET PROCESSING



Attachment 3 (cont'd)




D
E
FORMS CONTROL STATION
Start of IMS Postprocessing Procedures
2
3
Check IMS Reports for Input Errors
Criterion Exercises Scan Sheets
Any Input Errors ?
Yes
Correct C.E & I.D. Scan Sheets and prepare for Rerun
No
1
Prepare IMS Reports for distribution
File Copy of IMS Reports for SWRL reference
SCHOOL SITE
ComSys I or II
5
Reports at School Site